

Serial No. 09/895,152  
Reply to Office Action dated October 8, 2003

Docket No. MEMS-0160-US

### **REMARKS/ARGUMENTS**

Favorable reconsideration and allowance of the present patent application are respectfully requested in view of the foregoing amendments and the following remarks. Claims 5, 26, and 29-35 are canceled. Claims 36-42 are added. Claims 1-4, 6-25, 27-28 and 36-42 are pending in the application.

### **35 U.S.C. § 102 & 103 Rejections**

Claims 1-7 and 23-28 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Mazed (U.S. Patent No. 6,411,642). Claims 8-22 were rejected under 35 U.S.C. § 103 (a) as allegedly being unpatentable over Mazed (U.S. Patent No. 6,411,642) in view of Feldman et al. (U.S. Patent No. 6,071,652, "Feldman"). Applicant respectfully traverses each of these rejections for at least the following reasons.

Claim 1 has been amended to include the features of claim 5. Regarding the rejection of this claim, the Examiner states on page 2 of the Office Action that Mazed discloses "performing multiple passes (at least four passes constitute four exposed regions such that no two passes write along the same path) onto the photoresist to form a desired pattern on the photo resist...". Further, the Examiner apparently alleges that this teaches the claimed features of claim 1 as amended.

However, in contrast to the Examiner's interpretation, Mazed clearly discloses that the pattern developed using multiple passes is a single "region" and provides no teaching or suggestion to offset each pass such that no two passes write along the same path. As clearly stated in Mazed, Fig. 3C is a sectional view of one region (130a) that has a specific grating pattern. Accordingly, the "pattern" that is written in multiple passes is the clearly this single region not the multiple regions as alleged by the

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Examiner. Further, Mazed specifically teaches the following regarding writing this pattern in column 8, lines 8-14.

The direct writing of the pattern can be performed in multiple passes with reduced electron or ion beam intensity. The desired pattern can be written on the photoresist by a multi-pass electron or ion beam lithography at 50 KV or 100 KV. The total exposure dose can be divided over many passes to reduce non-uniformity and stitching errors during the electron or ion-beam writing.

As can be clearly seen from the above-cited passage, there is no teaching or suggestion to offset each writing pass.

As stated in MPEP § 2131, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ...claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The references applied by the Examiner neither expressly nor inherently describes every feature of Applicant's claimed combinations as detailed in the foregoing arguments. Therefore, Applicant respectfully submits that the applied reference does not anticipate Applicant's claimed combinations as alleged by the Examiner.

Regarding the rejection of claim 8, the Examiner has alleged that the combination of Mazed and Feldman discloses Applicant claims combinations. Applicant respectfully disagrees. The deficiencies of the Mazed reference were previously addressed. Further, Feldman discloses only reflowing the photoresist to address the discontinuous (i.e., stepwise) nature of their grayscale profile. This is clearly stated in column 8 lines 7-14, which is quoted below (with emphasis added).

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When forming a refractive element using a gray scale mask that does not itself have a continuous profile, such as the gray scale mask formed in accordance with the present invention, it may be desirable to reflow the photoresist before the final step 38 of forming the element. This reflow would involve only heating the photoresist up by a small amount such that any obvious discontinuities arising from the step wise nature of the gray scale mask will be eliminated.

As clearly stated in Feldman, the reflow process is used to eliminate the step wise nature of gray scale mask. However, in contradiction to the teachings of Feldman, Mazed does not use a gray scale process and requires the step profile to achieve the grating pattern illustrated in Fig. 3C.

As stated in MPEP § 2143.01, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Further, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Accordingly, assuming the references could be combined as alleged by the Examiner (which Applicant does not admit), reflowing the photoresist Mazed to eliminate the step profile and form a continuous profile as taught in Feldman would render the Mazed invention being modified unsatisfactory for its intended purpose. Therefore, there is no motivation to make the proposed modification as alleged by the Examiner and the combination does not render Applicant's claimed combinations prima facie obvious.

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Further, as noted in the previously quoted passage, Feldman uses the reflow to compensate for the step wise nature of the gray scale mask being used and form a continuous profile. In contrast, claim 8 recites "melting at least a portion of the photosensitive material, whereby general roughness error is reduced". As noted in Applicants specification in paragraph 14, the general roughness error is "caused by the slight variations in the dose of the writing tool, usually an electron beam (e-beam) or laser. In the case of the half tone process, the chosen pixel shape scheme may cause this error. The period of oscillation for the general roughness error is typically on the order of 10 microns."

The remaining independent claims (i.e., claims 23 and 36) recite related subject matter to the above-identified independent claims, and are therefore allowable for reasons similar to those given above.

The dependent claims are allowable at least by virtue of their dependency on the above-identified independent claims. See MPEP § 2143.01. Moreover, these claims recite additional subject matter, which is not suggested by the documents taken either alone or in combination. For instance, the Examiner has not alleged or shown that the references teach or suggest the specific heating sources or requirements claimed such as in claims 13-17.

### **CONCLUSION**

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the

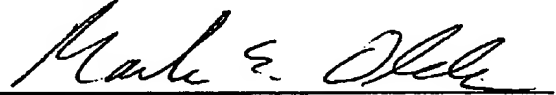
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Examiner is invited to contact the undersigned attorney, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 50-2842 and please credit any excess fees to such deposit account.

Respectfully submitted,  
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Attachement(s):